This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

1. (Original) A method of equalizing a radio frequency (RF) signal comprising:
generating a cost function using amplitude and phase components of the output signal of an equalizer;
minimizing said cost function using a gradient recursion algorithm; and
adjusting the tap weights of said equalizer using the result of said gradient recursion algorithm.

2. (Original) The method of claim 1 wherein said cost function is defined by the equation $J_m(\mathbf{w}) = E\left\{\left(|z_k|^2 - A\right)^2 + \beta\left[\cos^2\left(\frac{z_{kr}}{2d}\pi\right) + \cos^2\left(\frac{z_{ki}}{2d}\pi\right)\right]\right\}$, where: w is a tap weight vector, z_k is the output of the equalizer after the kth iteration, A is the desired amplitude in the absence of interference, z_{kr} and z_{ki} are the real and imaginary parts of z_k, respectively, and β is a weighting factor.

3. (Original) The method of claim 1 wherein said gradient recursion algorithm is defined by the equation $\mathbf{w}_{k+1} = \mathbf{w}_k - \mu_m \nabla J_m(\mathbf{w})|_{\mathbf{w} = \mathbf{w}_k}$, where: w_{k+1} is a tap weight vector at the kth+1 instant, w_k is said tap weight vector at the kth instant, μ_m is the gradient step size, and $\nabla J_m(\mathbf{w})$ is the gradient of said cost function.

4. (Original) A apparatus for receiving a radio frequency (RF) signal comprising:
at least one antenna for receiving the RF signal;
at least one tuner for selecting the RF signal from a desired frequency band;
an equalizer having a plurality of tap weights; and
a modified constant modulus algorithm (M-CMA) circuit for adjusting said plurality of tap weights.

5. (Original) The apparatus of claim 4 wherein said equalizer comprises:

a plurality feed forward equalizers (FFEs), where each FFE is coupled to an antenna;

a combiner for combining the output signals from each of said plurality of feed forward equalizers to form a combined signal;

a carrier/slicer circuit for extracting the carrier from the combined signal and generating a symbol error signal; and

a decision feedback equalizer for suppressing inter-symbol interference in said combined signal;

wherein said M-CMA circuit adjusts the tap weights of said plurality of feed forward equalizers and said decision feedback equalizer.

6. (Original) The apparatus of claim 4 wherein said M-CMA circuit adjusts said tap weights by minimizing a cost function using a gradient recursion algorithm, wherein said cost function is derived using the amplitude and the phase of the output signal of said equalizer.

7. (Original) The apparatus of claim 6 wherein said cost function is defined by the equation $J_m(\mathbf{w}) = E\left\{\left(|z_k|^2 - A\right)^2 + \beta\left[\cos^2\left(\frac{z_{kr}}{2d}\pi\right) + \cos^2\left(\frac{z_{ki}}{2d}\pi\right)\right]\right\}$, where: w is a tap weight vector, z_k is the output of the equalizer after the kth iteration, A is the desired amplitude in the absence of interference, z_{kr} and z_{ki} are the real and imaginary parts of z_k, respectively, and β is a weighting factor.

8. (Original) The apparatus of claim 6 wherein said gradient recursion algorithm is defined by the equation $\mathbf{w}_{k+1} = \mathbf{w}_k - \mu_m \nabla J_m(\mathbf{w})|_{\mathbf{w} = \mathbf{w}_k}$, where: w_{k+1} is a tap weight vector at the kth+1 instant, w_k is said tap weight vector at the kth instant, μ_m is the gradient step size, and $\nabla J_m(\mathbf{w})$ is the gradient of said cost function.

9. (Original) An apparatus for equalizing a radio frequency (RF) signal comprising:

a plurality of feed forward equalizers;

a combiner for combining the output signals from each of said plurality of feed forward equalizers to form a combined signal;

a decision feedback equalizer for suppressing inter-symbol interference in said combined signal; and

a modified constant modulus algorithm (M-CMA) circuit for adjusting the tap weights of said plurality of feed forward equalizers and said decision feedback equalizer.

10. (Original) The apparatus of claim 9 wherein said M-CMA circuit adjusts said tap weights by minimizing a cost function using a gradient recursion algorithm, wherein said cost function is derived using the amplitude and the phase of the equalized output signal.

11. (Original) The apparatus of claim 10 wherein said cost function is defined by the equation $J_m(\mathbf{w}) = E\left\{\left(|z_k|^2 - A\right)^2 + \beta\left[\cos^2\left(\frac{z_{kr}}{2d}\pi\right) + \cos^2\left(\frac{z_{ki}}{2d}\pi\right)\right]\right\}$, where: w is a tap weight vector, z_k is the output of the equalizer after the kth iteration, A is the desired amplitude in the absence of interference, z_{kr} and z_{ki} are the real and imaginary parts of z_k, respectively, and β is a weighting factor.

12. (Original) The apparatus of claim 10 wherein said gradient recursion algorithm is defined by the equation $\mathbf{w}_{k+1} = \mathbf{w}_k - \mu_m \nabla J_m(\mathbf{w})|\mathbf{w} = \mathbf{w}_k$, where: w_{k+1} is a tap weight vector at the kth+1 instant, w_k is said tap weight vector at the kth instant, μ_m is the gradient step size, and $\nabla J_m(\mathbf{w})$ is the gradient of said cost function.